

Taxonomic Status and Location of Type Specimens for Species of *Coelinidea* Viereck and *Sarops* Nixon (Hymenoptera: Braconidae: Alysiinae) Described by Garland T. Riegel

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Abstract.—The following species of *Coelinidea* Viereck and *Sarops* Nixon described by Garland T. Riegel are transferred to other genera resulting in 28 new combinations: *Chorebus pallidus* (Riegel), n. comb., *Coelinus acicula* (Riegel), n. comb., *Coelinus acontia* (Riegel), n. comb., *Coelinus alima*, (Riegel), n. comb., *Coelinus alrutzae* (Riegel), n. comb., *Coelinus arizona* (Riegel), n. comb., *Coelinus arnella* (Riegel), n. comb., *Coelinus bakeri* (Riegel), n. comb., *Coelinus baldufi* (Riegel), n. comb., *Coelinus calcara* (Riegel), n. comb., *Coelinus columbia* (Riegel), n. comb., *Coelinus crota* (Riegel), n. comb., *Coelinus dubius* (Riegel), n. comb., *Coelinus ellenaee* (Riegel), n. comb., *Coelinus frisoni* (Riegel), n. comb., *Coelinus garthi* (Riegel), n. comb., *Coelinus hayesi* (Riegel), n. comb., *Coelinus jeanae* (Riegel), n. comb., *Coelinus marki* (Riegel), n. comb., *Coelinus marylandicus* (Riegel), n. comb., *Coelinus minnesota* (Riegel), n. comb., *Coelinus montana* (Riegel), n. comb., *Coelinus muesebecki* (Riegel), n. comb., *Coelinus nellae* (Riegel), n. comb., *Coelinus niobrara* (Riegel), n. comb., *Coelinus robiniae* (Riegel), n. comb., *Coelinus ruthae* (Riegel), n. comb., and *Coelinus sommermanae* (Riegel), n. comb. *Coelinus ohioensis* (Riegel, 1982), and *Coelinus wheeleri* (Riegel, 1982) are new synonyms, and the former is designated the senior synonym because the holotype is a female. The holotypes of *Coelinidea antha* Riegel, *Coelinidea arca* Riegel, *Coelinidea colora* Riegel, and *Coelinidea coma* Riegel, reportedly deposited at the Academy of Natural Sciences, Philadelphia, Pennsylvania, apparently are lost. Therefore, all four names are considered *nomina dubia* since each species is known only from the holotype, and information Riegel provided in the original descriptions and key to North American species of *Coelinidea* is not adequate to apply the names unequivocally. The locations of primary and, where applicable, secondary types are indicated for all other species of *Coelinidea* and *Sarops* described by Riegel. *Coelinus alima*, *C. marki*, *C. ohioensis*, and *C. robiniae* are first recorded from Quebec, Wyoming, Wisconsin, and Kansas and Missouri, respectively.

Alysiinae is a speciose subfamily of koinobiont endoparasitoids of cyclorrhaphous Diptera (Wharton 1997). The subfamily consists of Alysiini and Dacnusini with ~1,245 and ~817 described species, respectively, as of mid-November 2007 for Alysiini and mid-June 2008 for Dacnusini (Yu et al. 2005). Most species of Alysiini with known hosts are parasitoids of saprophagous flies; as far as is known, all dacnusines are parasitoids of plant-feeding flies (Wharton 1997). The Palearctic species of Dacnusini have been studied extensive-

ly, including comprehensive taxonomic revisions (Griffiths 1964, 1966a, 1966b, 1967, 1968a, 1968b, Nixon 1937, 1943, 1944, 1945, 1946, 1948, 1949, 1954). Few taxonomic treatments have been published for Nearctic dacnusines; notable works include Rohwer (1914), Riegel (1950, 1982), Wharton (1994), and Kula and Zolnerowich (2008).

Riegel (1982) revised the Nearctic species of *Chaenusa* Haliday *sensu stricto*, *Chorebidea* Viereck, *Chorebidella* Riegel, *Coelinidea* Viereck, and *Sarops* Nixon. The revision, based

largely on Riegel's doctoral dissertation from 1947, included descriptions of 44 new species, over half of the ~86 described Nearctic species of Dacnusiini (Yu et al. 2005). Several taxonomic changes occurred in the 35 years between completion and publication of the revision. Griffiths (1964) provided hypotheses on character polarity for dacnusiines and for the most part only recognized groups he considered monophyletic. As a result Griffiths (1964) synonymized *Chorebidea* Viereck, 1913 and *Chorebidella* Riegel, 1950 with *Chaenusa* Haliday, 1839 (i.e., *Chaenusa sensu lato*). Further, Griffiths (1964) treated *Coelinidea* Viereck, 1913 and *Polemochartus* Schulz, 1911 as subgenera of *Coelinus* Nees, 1819 (i.e., *Coelinus s.l.*) and synonymized *Sarops* Nixon, 1942 with *Synelix* Förster, 1862. Riegel (1982), in reference to Griffiths (1964), stated that he was "not convinced that certain genera should have been placed in synonymy" and recognized *Chorebidea*, *Coelinidea*, and *Sarops* as valid genera and described four, 32, and four new species in each genus, respectively. Wharton and Austin (1991) agreed with the synonymies in Griffiths (1964) and determined that *Lepton* Zetterstedt, 1838 has priority over *Coelinidea* but considered the division of *Coelinus* into subgenera "premature" because of undescribed "intermediate forms" from the Oriental Region. However, Wharton and Austin (1991) did not transfer any of the species described in Riegel (1982) to *Chaenusa s.l.* or *Coelinus s.l.* Wharton (1994) considered *Coelinus s.l.* monophyletic based on three putative apomorphies, the presence of an additional tooth between tooth one and two, a laterally compressed gaster, and the exclusive use of chloropids as hosts, and on this basis synonymized *Sarops* with *Coelinus* rather than following the synonymy of *Sarops* and *Synelix* in Griffiths (1964). Kula and Zolnerowich (2008) transferred the species of *Chorebidea* described in Riegel (1982) to *Chaenusa s.l.* and returned *Chorebidella bergi* Riegel to *Chaenusa s.l.*

I agree with Wharton (1994) and consider *Coelinus s.l.* monophyletic based on the apomorphies mentioned above. Kula (2006) recovered *Coelinus sensu* Wharton (1994) as monophyletic in one of two preliminary cladistic analyses for Dacnusiini based on morphology, but bootstrap support was low. Clades corresponding to *Coelinus s.s.*, *Lepton*, and *Polemochartus* were also recovered, with the included species of *Coelinus s.s.* and *Sarops* forming a clade, but only *Polemochartus* had moderate bootstrap support. Therefore, I agree with Wharton and Austin (1991) and Wharton (1994) that *Coelinus s.l.* should not be split into genera or divided into subgenera at this point in time since only *Polemochartus* is clearly monophyletic.

The species of *Sarops* described in Riegel (1982) were transferred to *Coelinus* through the synonymy of *Coelinus* and *Sarops* in Wharton (1994), but the taxonomic placement of each species has not been verified through the examination of holotypes. The species of *Coelinidea* described in Riegel (1982) have not been transferred to *Coelinus s.l.*, and holotypes should be examined for these species to verify placement before they are transferred. Holotypes of several species described in Riegel (1982) are currently housed in repositories other than those indicated in the original descriptions, and four holotypes apparently are lost. Therefore, the primary objectives of this study are to (1) verify and update the taxonomic placement of species of *Coelinidea* and *Sarops* described in Riegel (1982) and (2) document the location and condition of holotypes for these species since most are known only from the holotype. Additionally, repositories are indicated for all paratypes of the aforementioned species, and new distribution records are provided for four species of *Coelinus s.l.*

MATERIALS AND METHODS

Specimens were examined using a Leica Wild M10 stereomicroscope with 25×

oculars. Images of holotypes were captured using a Microoptics digital camera system, and image clarity was enhanced using Adobe Photoshop 9.0. A color image of each holotype was deposited in Morphbank (collection number 369162), and if a holotype is damaged, its condition is described. Morphological terminology follows Sharkey and Wharton (1997) except as noted below. All species in this study have three major mandibular teeth; the recognition and numbering of teeth follows Wharton (2002) and Wharton (1977), respectively. Tooth one is the dorsal tooth, tooth two is the middle tooth, and tooth three is the ventral tooth. In addition to the three major teeth, a smaller tooth is present between tooth two and three in *Chorebus pallidus* (Riegel), new combination and is referred to as tooth four. Another smaller tooth is present between tooth one and two in all species and is referred to as tooth five. Thus, the numbering of mandibular teeth in this article differs from Kula and Zolnerowich (2008) in that the latter article referred to a smaller additional tooth as tooth four regardless of its position. The apical rim of the clypeus, metapleural rosette, and tuft of curved setae on the metacoxa are as in Kula and Zolnerowich (2008).

The material examined sections are formatted as in Kula and Zolnerowich (2008). Exact label data are reported for holotypes; Riegel (1982) provided more extensive type locality information. The following museum codens (Evenhuis and Samuelson 2007) are used to indicate repositories where type specimens of species Riegel (1982) described in *Coelinidea* and *Sarops* are housed currently: Albert J. Cook Arthropod Research Collection, Michigan State University, East Lansing (MSUC); California Academy of Sciences, San Francisco (CAS); Canadian National Collection of Insects, Ottawa (CNC); Cornell University Insect Collection, Ithaca, New York (CUIC); Illinois Natural History Survey, Champaign (INHS); Museum of

Comparative Zoology, Harvard University, Cambridge, Massachusetts (MCZ); Smithsonian Institution National Museum of Natural History, Washington, DC (USNM); Snow Entomological Museum, University of Kansas, Lawrence (SEMC); University of Minnesota Insect Collection, Saint Paul (UMSP); and University of Wyoming Insect Museum, Laramie (ESUW). The holotypes of *Coelinidea antha* Riegel, *Coelinidea arca* Riegel, *Coelinidea colora* Riegel, and *Coelinidea coma* Riegel, reportedly deposited at the Academy of Natural Sciences, Philadelphia, Pennsylvania (ANSP), apparently are lost and could not be examined. All other holotypes of species Riegel (1982) described in *Coelinidea* and *Sarops* were examined, as were all paratypes except specimens of *Coelinus acontia* (Riegel), new combination at ESUW, *Coelinus marylandicus* (Riegel), new combination at MCZ, and *Coelinus niobrara* (Riegel), new combination at ESUW.

In addition to the repositories listed above, new distribution records and synonyms were discovered through examination of specimens borrowed from the American Entomological Institute, Gainesville, Florida (AEIC) and the Bohart Museum of Entomology, University of California, Davis (UCDC). Entries with an asterisk are new distribution records.

The specific epithets of *C. acontia*, *Coelinus alima* (Riegel), new combination, *Coelinus arnella* (Riegel), new combination, *Coelinus calcara* (Riegel), new combination and *Coelinus crota* (Riegel), new combination, show evidence of being derived from Latin or Greek words. However, they cannot be traced in a standard dictionary and do not follow established rules of Latin grammar. Therefore, in accordance with ICZN Article 31.2.2, "the original spelling is...retained [for the aforementioned specific epithets], with gender ending unchanged" since "the evidence of usage is not decisive" (ICZN 1999).

RESULTS AND DISCUSSION

Chorebus pallidus (Riegel), new combination
(Fig. 1)

Coelinidea pallida Riegel 1982: 80, 92 [USNM, examined].

Type material.—*Holotype male*: Top label (white; partially handwritten, partially typewritten) = "Washgtn [;] 30-6 DC". Second label (white; typewritten) = "Type". Third label (white; handwritten) = "Chaenon [;] pallidus [;] ♀ Ashm". Fourth label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] pallida [;] Riegel" (USNM). *Paratypes*: 1 [sex unknown] USA, WASHINGTON, DC, 30.vi, Collection Ashmead (USNM).

Discussion.—Riegel (1982) indicated that the holotype and paratype of *C. pallidus* were deposited at USNM. The holotype bears a glass vial with a cork cap between the third and fourth labels. The vial contains the posterior portion of the metasoma. The antennae are broken, as is the tarsus of one prothoracic leg. One mesothoracic leg is missing except for the coxa and trochanter; the other is broken at the coxa. One metathoracic leg is broken at the coxa. Either a meso- or metathoracic leg that has broken off of the specimen at the trochanter is glued to the point.

The mandible of *C. pallidus* has five teeth, with tooth four between tooth two and three and tooth five between tooth one and two. *Coelininus s.l.* is partially defined by the presence of a small tooth between tooth one and two; *Chorebus* is partially defined by the presence of a small tooth between tooth two and three. Thus, the mandible is intermediate between *Chorebus* and *Coelininus s.l.* However, *C. pallidus* has a complete metapleural rosette, a narrow, smooth sternaulus, and a tuft of curved setae on the metacoxa, features Griffiths (1968b) used to define the *Chorebus affinis*-group but not found among species of *Coelininus s.l.* Additionally, the apical rim of the clypeus is present in *C. pallidus*, and t2 is

smooth. The apical rim is present in all species of *Chorebus*, and t2 is smooth in most species. The apical rim is present in species of *Coelininus s.l.* that fit *Coelininus s.s.* (Griffiths 1964, Riegel 1982) and *Sarops sensu* Riegel (1982) and Maetô (1983), but t2 is striate. Therefore, *C. pallidus* is transferred to *Chorebus* because it fits the genus aside from the additional tooth between tooth one and two and otherwise fits the *affinis*-group.

Coelininus acicula (Riegel), new combination
(Fig. 2)

Coelinidea acicula Riegel 1982: 82, 109 [SEMC, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "Northgate Colo [;] 8-20-31 [;] L. D. Anderson". Bottom label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] acicula [;] Riegel" (SEMC).

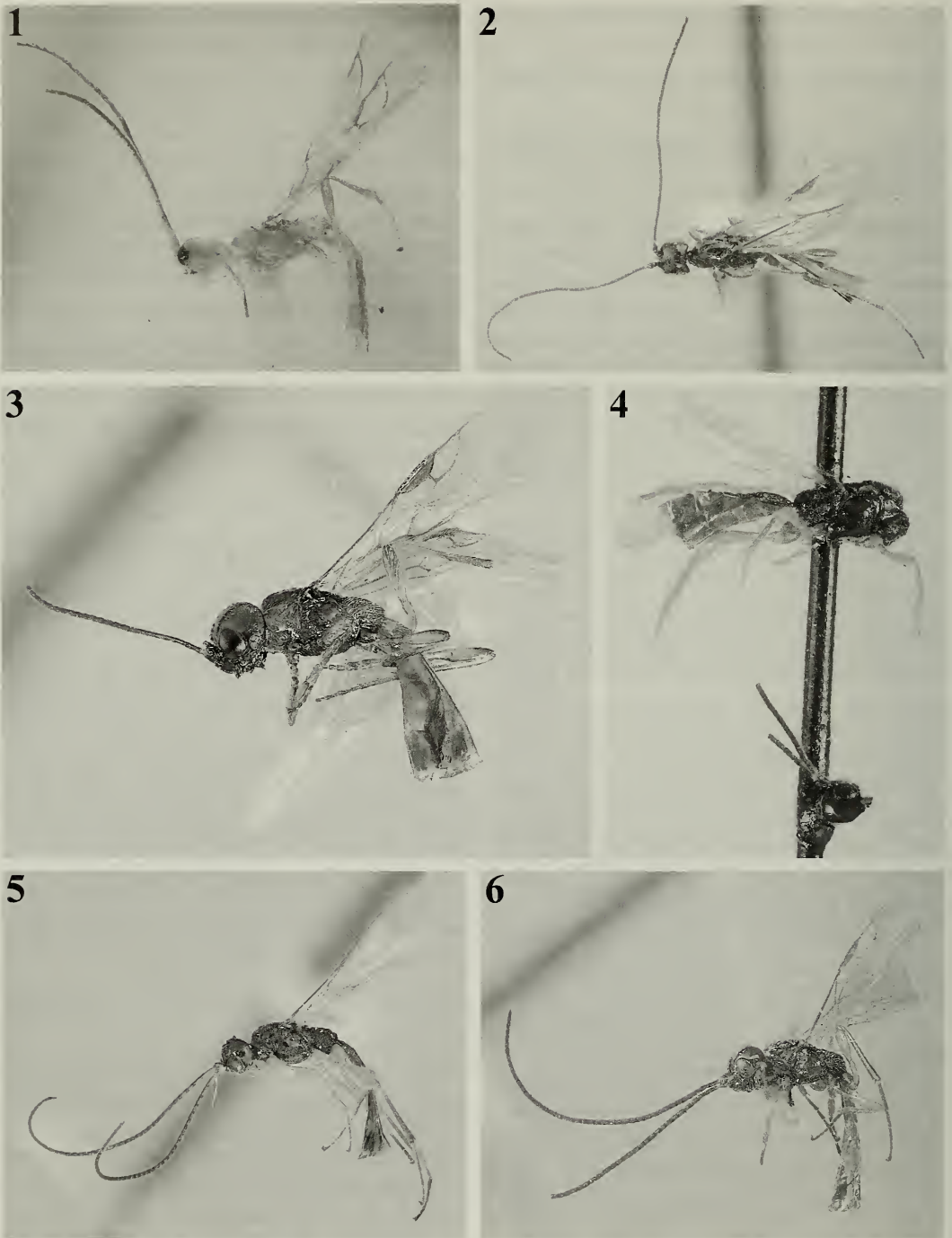
Discussion.—*Coelininus acicula* is known only from the holotype, which Riegel (1982) indicated was deposited at the "University of Kansas...(KU)." The holotype bears a glass vial with a cork cap between the top and bottom labels. The vial contains the posterior portion of the metasoma. One antenna is broken.

Coelininus acontia (Riegel), new combination
(Fig. 3)

Coelinidea acontia Riegel 1982: 81, 102 [INHS, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 213,095". Second label (white; handwritten) = "Albany Co., Wyo" [;] July 11, 1944 [;] R. E. Pfadt". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Coelinidea [;] acontia [;] Riegel" (INHS). *Paratypes*: 1 ♀ same data as holotype (ESUW); USA, WYOMING: 1 ♂ Goshen Co., 21.vii.1944, R. E. Pfadt, INHS Insect Collection 213,096 (INHS); 1 ♂ Platte Co., 13.vii.1944, R. E. Pfadt (ESUW).

Discussion.—Riegel (1982) indicated that the holotype and all paratypes of *C. acontia*



Figs 1–6. Holotypes of species of *Coelinidea* and *Sarops* described in Riegel (1982) with current taxonomic affiliations. 1, *Chorebus pallidus*. 2, *Coelinus acicula*. 3, *Coelinus acontia*. 4, *Coelinus alberta*. 5, *Coelinus alima*. 6, *Coelinus alrutzae*.

were deposited at the "University of Wyoming...(WYO)." Scott Shaw (in litt.) confirmed that ESUW has two paratypes, but INHS currently has the holotype and a paratype. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma. The antennae are broken, as is the tarsus of one pro- and mesothoracic leg. One metatarsus is broken; the other is missing.

Coelinius alberta (Riegel)
(Fig. 4)

Sarops alberta Riegel 1982: 56, 57 [CNC, examined].

Coelinius alberta: Wharton 1994: 631 [synonymy of *Coelinius* and *Sarops*].

Type material.—*Holotype female*: Top label (white; partially handwritten, partially typewritten) = "Banff, Alta. [;] 16 vi.1922 [;] C. B. D. Garrett". Second label (yellow; handwritten) = "wing [;] on slide". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] *Sarops* [;] *alberta* [;] Riegel". Fourth label (red; partially handwritten, partially typewritten) = "HOLOTYPE [;] 21202 [;] CNC No." (CNC).

Discussion.—*Coelinius alberta* is known only from the holotype, which Riegel (1982) indicated was deposited at the "Canadian Department of Agriculture, G. S. Walley (GSW)." The holotype bears a glass vial with a cork cap between the top and second labels. The vial contains some debris but otherwise appears to be empty. The head has been broken off of the specimen and is glued to the pin. The antennae are broken, as are the tarsi except for one mesotarsus. One forewing is mounted on a slide.

Coelinius alima (Riegel), new combination
(Fig. 5)

Coelinidea alima Riegel 1982: 85, 143 [INHS, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "INHS [;] Insect Collec-

tion [;] 201,193". Second label (white; typewritten) = "Fox Lake, Ill." [;] June 3, 1943 [;] Ross&Sanderson". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] *Coelinidea* [;] *alima* [;] Riegel" (INHS). *Paratypes*: 1 ♂ same data as holotype except INHS Insect Collection 201,194 (INHS).

Other material examined.—*CANADA: QUEBEC: 1 ♀ 2 ♂ *Témiscamingue*, Laniel, 8.vii.1944, A. R. Brooks (CNC).

Discussion.—Riegel (1982) indicated that the holotype and paratype of *C. alima* were deposited at INHS. A glass vial with a cork cap was associated with the holotype at some point in time. The cap is still associated, but apparently the vial has been lost. The specimens from CNC expand the range of this species to southeastern Quebec.

Coelinius alrutzae (Riegel), new combination
(Fig. 6)

Coelinidea alrutzae Riegel 1982: 83, 119 [INHS, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 201,195". Second label (white; partially handwritten, partially typewritten) = "Algonquin, Ill. [;] June 15 '08 [;] Nason 192". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] *Coelinidea* [;] *alrutzae* [;] Riegel" (INHS).

Discussion.—*Coelinius alrutzae* is known only from the holotype, which Riegel (1982) indicated was deposited at the "University of Illinois...(UILL)." The University of Illinois insect collection was transferred to INHS in 1979 (P. Tinerella in litt.), and thus, Riegel apparently deposited the holotype in INHS. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma. One antenna is broken. One prothoracic leg is missing except for the coxa; the other has a broken tarsus.

Coelinius arizona (Riegel), new combination
(Fig. 7)

Coelinidea arizona Riegel 1982: 81, 107 [USNM, examined].

Type material.—*Holotype male*: Top label (white; partially handwritten, partially typewritten) = "Huachuca Mts. [;] Ariz., 4-14 1938 [;] R. H. Crandall". Second label (white; handwritten) = "171". Third label (white; partially handwritten, partially typewritten) = "Coelinidea [;] sp. [;] det [;] Mues". Fourth label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] arizona [;] Riegel" (USNM).

Discussion.—*Coelinus arizona* is known only from the holotype, which Riegel (1982) indicated was deposited at the "University of Arizona...(ARIZ)." The holotype was transferred to USNM in 1999 (D. Furth in litt.). The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma. The antennae are broken. One prothoracic leg is imbedded in glue; the other has a broken tarsus. One mesothoracic leg has a broken tarsus; the other is missing except for the coxa, trochanter, and trochantellus, as is the case with one metathoracic leg. One forewing is missing; the other wings are torn and missing distally.

Coelinus arnella (Riegel), new combination
(Fig. 8)

Coelinidea arnella Riegel 1982: 82, 114 [INHS, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 201,099". Second label (white; partially handwritten, partially typewritten) = "Mont. Exp. Sta. [;] Sidney, Mont. [;] June 14, 1913". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] arnella [;] Riegel". Fourth label (white; handwritten) = "[MON]". Fifth label (white; typewritten) = "INHS [;] TYPE [;] #2030" (INHS).

Discussion.—*Coelinus arnella* is known only from the holotype. Riegel (1982) indicated that the holotype was deposited at "Montana State College...(MONT)," but INHS currently has the holotype. The holotype bears a glass vial with a cork

cap below the fifth label. The vial contains the posterior portion of the metasoma. The antennae are broken, and the forewings are torn.

Coelinus bakeri (Riegel), new combination
(Fig. 9)

Coelinidea bakeri Riegel 1982: 83, 123 [USNM, examined].

Type material.—*Holotype male*: Top label (white; partially handwritten, partially typewritten) = "Colo [;] 1563". Second label (white; typewritten) = "Collection [;] CFBaker". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] bakeri [;] Riegel" (USNM).

Other material examined.—USA, COLORADO: 3 ♀ Larimer Co., Estes Park, 5.viii.1947, L. D. Beamer (SEMC).

Discussion.—*Coelinus bakeri* was previously known only from the holotype, which Riegel (1982) indicated was deposited at USNM. The holotype bears a glass vial with a cork cap between the second and third labels. The vial contains the posterior portion of the metasoma. The antennae are broken. Riegel (1982) indicated that the holotype was collected in Fort Collins, Larimer County, Colorado.

Coelinus baldufi (Riegel), new combination
(Fig. 10)

Coelinidea baldufi Riegel 1982: 79, 86 [SEMC, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "Little Beaver Cr. [;] Colo 7 - 11 - 37 [;] C. L. Johnston". Second label (white; typewritten) = "Wing on [;] Sl. No.". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] baldufi [;] Riegel" (SEMC).

Discussion.—*Coelinus baldufi* is known only from the holotype, which Riegel (1982) indicated was deposited at "KU." The holotype bears a glass vial with a cork cap between the top and second labels. The vial contains the posterior portion of the metasoma. One forewing is mounted on a slide.



Figs 7–13. Holotypes of species of *Coelinidea* described in Riegel (1982) with current taxonomic affiliations. 7, *Coelinius arizona*. 8, *Coelinius arnella*. 9, *Coelinius bakeri*. 10, *Coelinius baldufi*. 11, *Coelinius calcara*. 12, *Coelinius columbia*. 13, *Coelinius crota*.

Coelinius calcara (Riegel), new combination
(Fig. 11)

Coelinidea calcara Riegel 1982: 81, 106 [CAS, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "Sparks Nev. [;] June 28 1927". Second label (white; typewritten) = "EPVanDunzee [;] Collector". Third label (brown; partially handwritten, partially typewritten) = HOLOTYPE ♀ [;] Coelinidea [;] calcara [;] Riegel". Fourth label (white; partially handwritten, partially typewritten) = "California Academy [;] of Sciences [;] Type 16687 [;] No." (CAS). *Paratypes*: 1 ♂ same data as holotype; USA, CALIFORNIA: 1 ♀ Inyo Co., Lone Pine, 10.vii.1929, R. L. Usinger; 1 ♀ San Diego Co., Pine Valley, 24.iv.1920, E. P. VanDunzee; 1 ♂ same data as previous except W. M. Giffard; 1 ♂ same data as previous except E. P. VanDunzee, *Coelinidea calcara* Riegel, 16687 (CAS).

Discussion.—Riegel (1982) indicated that the holotype and all paratypes of *C. calcara* were deposited at the "California Academy of Sciences...(CALAS)." The holotype bears a glass vial with a cork cap between the second and third labels. The vial contains the posterior portion of the metasoma. One antenna is broken.

Coelinius columbia (Riegel), new combination
(Fig. 12)

Coelinidea columbia Riegel 1982: 85, 144 [CUIC, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "Columbia, Mo. [;] May 26-June 8, '06. [;] C.R. Crosby Coll.". Second label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Coelinidea [;] columbia [;] Riegel". Third label (red; partially handwritten, partially typewritten) = "HOLOTYPE [;] Cornell U. [;] No. 6491" (CUIC). *Paratypes*: USA, NEW YORK: 1 ♀ Tompkins Co., McLean, 2.vii.-3.vii.1904, PARATYPE, Cornell U., No. 6491 (CUIC).

Discussion.—Riegel (1982) indicated that the holotype and paratype of *C. columbia* were deposited at "Cornell University...(CN)." The holotype bears a glass vial

with a cork cap between the top and second labels. The vial contains the posterior portion of the metasoma. One antenna is broken.

Coelinius crota (Riegel), new combination
(Fig. 13)

Coelinidea crota Riegel 1982: 79, 90 [INHS, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 201,196". Second label (white; typewritten) = "Apple Riv. Can. S.P. [;] Ill., Aug. 23, 1939 [;] Ross & Riegel". Third label (brown; partially handwritten, partially typewritten) = HOLOTYPE ♂ [;] Coelinidea [;] crota [;] Riegel" (INHS).

Discussion.—*Coelinius crota* is known only from the holotype, which Riegel (1982) indicated was deposited at INHS. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma.

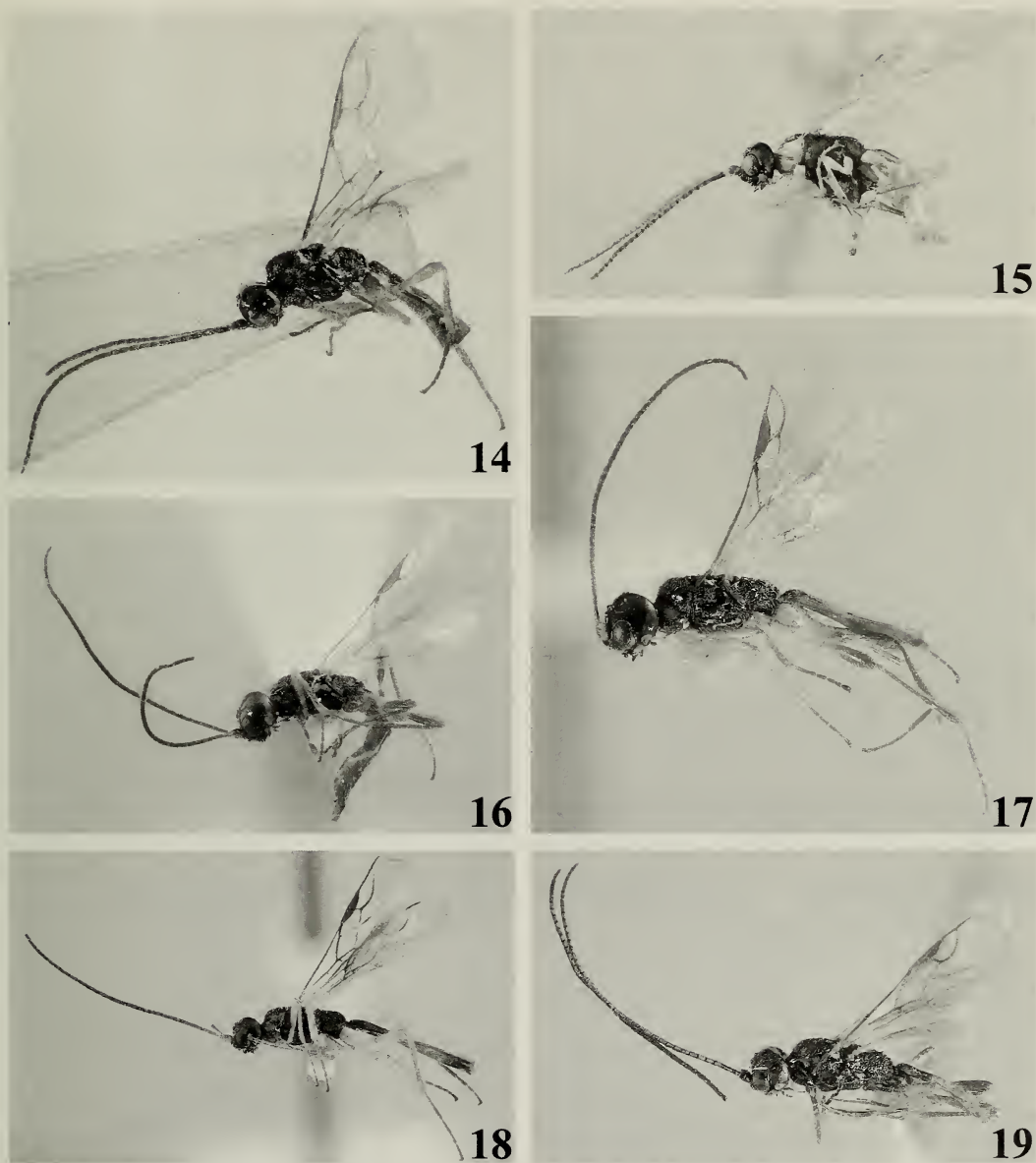
Coelinius dreisbachi (Riegel)
(Fig. 14)

Sarops dreisbachi Riegel 1982: 57, 60 [MSUC, examined].

Coelinius dreisbachi: Wharton 1994: 631 [synonymy of *Coelinius* and *Sarops*].

Type material.—*Holotype male*: Top label (white; partially handwritten, partially typewritten) = "Midland Co., Mich. [;] 5-21-42 [;] R. R. Dreisbach". Second label (yellow; handwritten) = "wing [;] on slide". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Sarops [;] dreisbachi [;] Riegel" (MSUC).

Discussion.—*Coelinius dreisbachi* is known only from the holotype. Riegel (1982) indicated that "R. R. Dreisbach (DREI)" either loaned or donated the holotype but did not specify where the holotype was deposited. The holotype is currently housed in MSUC, presumably donated after Dreisbach's death, and bears a glass vial with a cork cap between the top and second label. The vial contains the posterior portion of the



Figs 14–19. Holotypes of species of *Coelinidea* and *Sarops* described in Riegel (1982) with current taxonomic affiliations. 14, *Coelinus dreisbachi*. 15, *Coelinus dubius*. 16, *Coelinus ellenaee*. 17, *Coelinus frisoni*. 18, *Coelinus garthi*. 19, *Coelinus hayesi*.

metasoma. One antenna is broken. One forewing is mounted on a slide, and a forewing and hind wing are torn.

Coelinus dubius (Riegel), new combination
(Fig. 15)

Coelinidea dubia Riegel 1982: 84, 129 [INHS, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 201,197". Second label (white; typewritten) = "3326". Third label (white; typewritten) = "Ashmead [;] Det. '99". Fourth label (brown; partially handwritten, partially typewritten) = HOLOTYPE ♂ [;] *Coelinidea* [;] *dubia* [;] Riegel" (INHS).

Discussion.—*Coelinus dubius* is known only from the holotype, which Riegel

(1982) indicated was deposited at INHS. The holotype bears a glass vial with a cork cap below the fourth label. The vial contains the posterior portion of the metasoma. The antennae are broken.

Coelinius ellenaee (Riegel), new combination
(Fig. 16)

Coelinidea ellenaee Riegel 1982: 81, 105 [SEMC, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "Little Beaver Cr." [;] Colo 7 - 11 - 37 [;] C. L. Johnston". Bottom label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] ellenaee [;] Riegel" (SEMC).

Discussion.—*Coelinius ellenaee* is known only from the holotype, which Riegel (1982) indicated was deposited at "KU." The holotype bears a glass vial with a cork cap between the top and bottom labels. The vial contains the posterior portion of the metasoma. One antenna is broken.

Coelinius frisoni (Riegel), new combination
(Fig. 17)

Coelinidea frisoni Riegel 1982: 83, 117 [INHS, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 201,198". Second label (white; typewritten) = "Empire, Colo. [;] July 23, 1938 [;] H.H. & J.A. Ross". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Coelinidea [;] frisoni [;] Riegel" (INHS).

Discussion.—*Coelinius frisoni* is known only from the holotype, which Riegel (1982) indicated was deposited at INHS. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma. One antenna is broken.

Coelinius garthi (Riegel), new combination
(Fig. 18)

Coelinidea garthi Riegel 1982: 84, 130 [INHS, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 201,199". Second label (white; typewritten) = "New Milford, Ill [;] July 2, 1936 [;] Ross & Parks". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] garthi [;] Riegel". Fourth label (white; handwritten) = "Freak [;] wing" (INHS).

Discussion.—*Coelinius garthi* is known only from the holotype, which Riegel (1982) indicated was deposited at INHS. The holotype bears a glass vial with a cork cap below the fourth label. The vial contains the posterior portion of the metasoma. The antennae are broken.

Coelinius hayesi (Riegel), new combination
(Fig. 19)

Coelinidea hayesi Riegel 1982: 83, 121 [USNM, examined].

Type material.—*Holotype male*: Top label (white; partially handwritten, partially typewritten) = "Colo [;] 1233". Second label (white; handwritten) = "31". Third label (white; typewritten) = "Collection [;] Ashmead". Fourth label (white; handwritten) = "Coelinius [;] longulus [;] Ashm.". Fifth label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] hayesi [;] Riegel" (USNM).

Discussion.—*Coelinius hayesi* is known only from the holotype, which Riegel (1982) indicated was deposited at USNM. The holotype bears a glass vial with a cork cap between the fourth and fifth labels. The vial contains the posterior portion of the metasoma. One antenna is broken at the pedicel; the flagellum of that antenna is stuck to the other antenna.

Coelinius jeanae (Riegel), new combination
(Fig. 20)

Coelinidea jeanae Riegel 1982: 79, 87 [INHS, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 201,200". Second label (white; partially handwritten, partially typewritten) = "Green Mt. Falls, [;] Colo. Jn. 21, 1938 [;] J.A. Ross". Third label (brown; partially handwritten, par-



Figs 20–26. Holotypes of species of *Coelinidea* described in Riegel (1982) with current taxonomic affiliations. 20, *Coelinus jeanae*. 21, *Coelinus marki*. 22, *Coelinus marylandicus*. 23, *Coelinus minnesota*. 24, *Coelinus montana*. 25, *Coelinus muesebecki*. 26, *Coelinus nellae*.

tially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] jeanae [;] Riegel" (INHS). *Paratypes*: 1 ♂ same data as holotype except 17.vii.1938, H. H. & J. A. Ross (INHS); 1 ♂ USA, COLORADO: Great Sand Dunes near Botger C.R., 23.vi.1944 (USNM).

Discussion.—Riegel (1982) indicated that the holotype and a paratype of *C. jeanae* were deposited at INHS and that a paratype was deposited at USNM. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma. The antennae are broken, as is the tarsus of one prothoracic leg.

Coelinus marki (Riegel), new combination
(Fig. 21)

Coelinidea marki Riegel 1982: 80, 97 [INHS, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 221,941". Second label (white; partially handwritten, partially typewritten) = "Green Mt. Falls, [;] Colo., Jly. 17, 1938 [;] J. A. Ross & [;] H. H. Ross". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Coelinidea [;] marki [;] Riegel" (INHS).

Other material examined.—USA, *WYOMING: 1 ♀ 1 [sex unknown] Big Horn Co., Cowley, 8.viii.1935, in wheat stem (ESUW).

Discussion.—*Coelinus marki* was previously known only from the holotype, which Riegel (1982) indicated was deposited at INHS. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma. The specimens from ESUW expand the range of this species to northwestern Wyoming.

Coelinus marylandicus (Riegel),
new combination
(Fig. 22)

Coelinidea marylandica Riegel 1982: 83, 125 [USNM, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "Md.". Second label (white; typewritten) = "Collection [;] Ash-

mead". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Coelinidea [;] marylandica [;] Riegel" (USNM). *Paratypes*: 1 ♀ same data as holotype; 1 ♀ same data as holotype except *Coelinus marylandicus* Ashm, *Coelinidea* n. sp. Mues.; USA, TENNESSEE: 1 ♂ Middle Tennessee, Cedar Glade Area, 9.xi, Adelpia Meyer, sweep net; 1 ♀ same data as previous except 524, *Coelinidea* n. sp. det. Mues. (USNM); USA, VIRGINIA: 1 ♀ Falls Church, 20.v, Nathan Banks (MCZ).

Discussion.—Riegel (1982) indicated that the holotype and four paratypes of *C. marylandicus* were deposited at USNM and a paratype was deposited at MCZ. The paratypes at USNM were examined, and Stefan Cover (in litt.) confirmed that the other paratype is at MCZ. The holotype bears a glass vial with a cork cap between the second and third labels. The vial contains the posterior portion of the metasoma. The head is missing, as are the mesothoracic legs except for the coxae. One prothoracic leg is missing except for the coxa; the other has a broken tarsus. One forewing is torn.

Coelinus minnesota (Riegel), new combination
(Fig. 23)

Coelinidea minnesota Riegel 1982: 84, 131 [UMSP, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "Minneapolis, Minn. [;] Excelsior Blvd. [;] Aug. 13, 1927 [;] A. T. Hertig". Bottom label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Coelinidea [;] minnesota [;] Riegel" (UMSP). *Paratypes*: 1 ♂ same data as holotype (UMSP).

Discussion.—Riegel (1982) indicated that the holotype and paratype of *C. minnesota* were deposited at the "University of Minnesota...(MINN)." The holotype bears a glass vial with a cork cap between the top and bottom labels. The vial contains the posterior portion of the metasoma.

Coelinus montana (Riegel), new combination
(Fig. 24)

Coelinidea montana Riegel 1982: 82, 111 [SEMC, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "Bennett Montana [;] 8-12-31 [;] J Nottingham". Bottom label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] montana [;] Riegel" (SEMC).

Discussion.—*Coelinus montana* is known only from the holotype, which Riegel (1982) indicated was deposited at "KU." The holotype bears a glass vial with a cork cap between the top and bottom labels. The vial contains the posterior portion of the metasoma. The head is missing.

Coelinus muesebecki (Riegel), new combination (Fig. 25)

Coelinidea muesebecki Riegel 1982: 84, 141 [INHS, examined].

Type material.—*Holotype female*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 221,942". Second label (white; handwritten) = "Ripley, Ill. [;] Sept. 1, 1939 [;] Ross & Riegel". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Coelinidea [;] muesebecki [;] Riegel" (INHS).

Discussion.—*Coelinus muesebecki* is known only from the holotype, which Riegel (1982) indicated was deposited at INHS. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma.

Coelinus nellae (Riegel), new combination (Fig. 26)

Coelinidea nellae Riegel 1982: 83, 116 [SEMC, examined].

Type material.—*Holotype male*: Top label (white; partially handwritten, partially typewritten) = "Summit Co., Ohio [;] 6-9 1937 [;] Louis J. Lipovsky". Bottom label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] nellae [;] Riegel" (SEMC).

Discussion.—*Coelinus nellae* is known only from the holotype, which Riegel (1982) indicated was deposited at "KU." The holotype bears a glass vial with a partially broken cork cap between the top and bottom labels. The vial contains the

posterior portion of the metasoma. One antenna is broken.

Coelinus niobrara (Riegel), new combination (Fig. 27)

Coelinidea niobrara Riegel 1982: 83, 122 [INHS, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "INHS [;] Insect Collection [;] 213,097". Second label (white; partially handwritten, partially typewritten) = "Niobrara Co. Wyo. Stop [;] July 1, 1943 [;] Collected by R.E. Pfadt". Third label (white; handwritten) = "LWYO". Fourth label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] niobrara [;] Riegel" (INHS). *Paratypes*: 1 ♂ same data as holotype except INHS Insect Collection 213,098 (INHS); 2 ♂ same data as holotype (ESUW).

Discussion.—Riegel (1982) indicated that the holotype and all paratypes of *C. niobrara* were deposited at "WYO." Scott Shaw (in litt.) confirmed that ESUW has two paratypes, but the INHS has the holotype and a paratype. The holotype bears a glass vial with a cork cap below the third label. The vial contains the posterior portion of the metasoma. One antenna is broken, as is the tarsus of one metathoracic leg.

Coelinus ohioensis (Riegel) (Figs 28, 29)

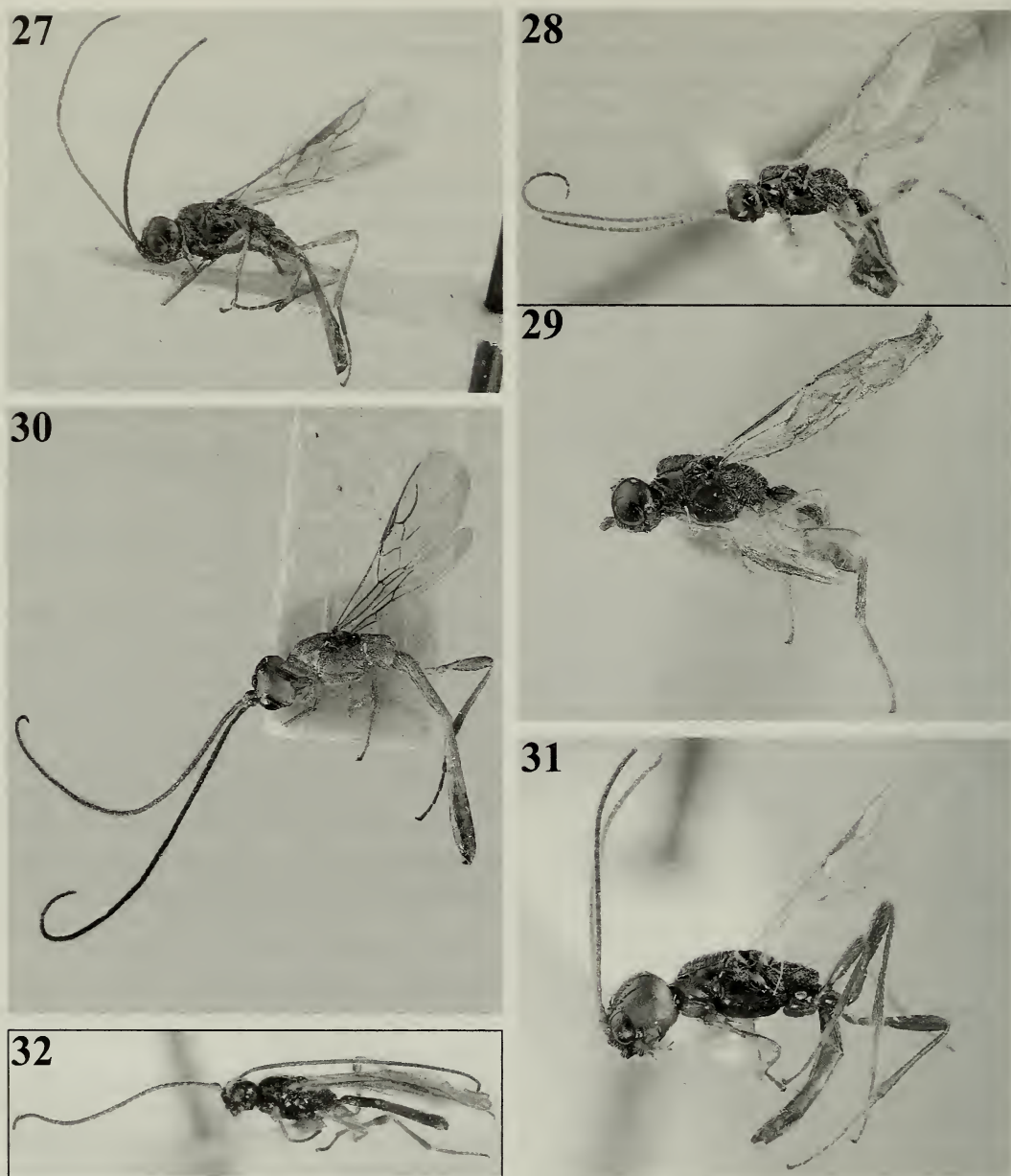
Sarops ohioensis Riegel 1982: 56, 58 [SEMC, examined].

Coelinus ohioensis: Wharton 1994: 631 [synonymy of *Coelinus* and *Sarops*].

Sarops wheeleri Riegel 1982: 56, 59 [INHS, examined].

Coelinus wheeleri: Wharton 1994: 631 [synonymy of *Coelinus* and *Sarops*]. New synonymy.

Type material.—*Holotype female*, *Sarops ohioensis*: Top label (white; partially handwritten, partially typewritten) = "Summit Co., Ohio [;] 9-1 1937 [;] Louis J. Lipovsky". Second label (yellow; handwritten) = "Wings [;] on slide". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♀ [;] Sarops [;] ohioensis [;] Riegel" (SEMC). *Holotype male*, *Sarops wheeleri*: Top label (white; typewritten) = "INHS [;] Insect



Figs 27–32. Holotypes of species of *Coelinidea* and *Sarops* described in Riegel (1982) with current taxonomic affiliations. 27, *Coelinus niobrara*. 28, *Coelinus ohioensis*. 29, *Coelinus wheeleri*. 30, *Coelinus robiniae*. 31, *Coelinus ruthae*. 32, *Coelinus sommermanae*.

Collection [;] 212,943". Second label (white; partially handwritten, partially typewritten) = "Contoocook [;] N.H. ix-4-'21 [;] E.W. Hall". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] *Sarops* [;] *wheeleri* [;] Riegel". Fourth label (yellow; handwritten) = "wings [;] on slide" (INHS).

Other material examined.—All USA, *WIS-CONSIN; 3 ♀ Fond du Lac Co., T13N R19E S23, 4.ix.1975, gypsy moth Malaise trap; 1 ♀ same data as previous except 4.ix.-9.ix.1975; 1 ♂ 1 ♀ same data as previous except 9.ix.-2.x.1975; 1 ♀ 1 ♂ Jackson Co., T21N R4W S27, 15.ix.-22.ix.1975, gypsy moth Malaise trap; 1 ♀ Oneida

Co., T35N R11E S17, 12.viii.-25.viii.1975, gypsy moth Malaise trap (AEIC).

Discussion.—The holotypes of *C. ohioensis* (Riegel, 1982) (Fig. 28) and *C. wheeleri* (Riegel, 1982) (Fig. 29) fit within a morphospecies series of seven females and two males from Wisconsin and are simply conspecific female and male specimens, respectively. The species are not referenced in the literature beyond Riegel (1982). Therefore, *C. ohioensis* is designated the senior synonym because the holotype is a female; in dacnines females usually have a greater number of diagnostic features compared to males.

Coelinus ohioensis and *C. wheeleri* were described from the holotypes only, which Riegel (1982) indicated were deposited at "KU" and INHS, respectively. The holotype of *C. ohioensis* bears a glass vial with a cork cap between the top and second labels. The holotype of *C. wheeleri* bears a glass vial with a cork cap below the fourth label. The vials contain the posterior portion of the metasoma of each species. One antenna of the *C. ohioensis* holotype is broken, and one forewing is mounted on a slide. The antennae of the *C. wheeleri* holotype are broken, as is the tarsus of one meso- and metathoracic leg. The other mesotarsus is missing. One forewing is mounted on a slide. The specimens from AEIC expand the range of this species to northern and central Wisconsin.

Coelinus robiniae (Riegel), new combination
(Fig. 30)

Coelinidea robiniae Riegel 1982: 83, 118 [USNM, examined].

Type material.—*Holotype male*: Top label (white; partially handwritten, partially typewritten) = "Harry L. Johnson [:] 8-14-1940 [:] So. Meriden Conn.". Second label (white; partially handwritten, partially typewritten) = *Coelinidea* [:] sp. [:] det [:] Mues". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [:] *Coelinidea* [:] *robiniae* [:] Riegel" (USNM).

Other material examined.—USA, *KANSAS: 1 ♂ Douglas Co., 23.v.1941, D. E. Hardy; 1 ♀ 5 ♂ same data as previous except 20.vi.1945, R. H. Beamer; 2 ♀ 7 ♂ same data as previous except 21.vi.1945; 2 ♀ same data as previous except 25.vi.1945 (SEMC); 1 ♀ 1 ♂ Riley Co., Konza Prairie Biological Station, watershed N2B, 39°05.27'N 96°35.09'W, 25.v.-27.v.2001, Zolnerowich, Kula, Brown, Malaise trap; 2 ♀ 1 ♂ same data as previous except 1.vi.-8.vi.2001; 1 ♀ same data as previous except 8.vi.-12.vi.2001; 3 ♂ same data as previous except watershed 4F, 39°04.37'N 96°34.26'W, 1.vi.-8.vi.2001; 5 ♂ same data as previous except 8.vi.-12.vi.2001; 8 ♂ same data as previous except 15.vi.-19.vi.2001; 1 ♀ same data as previous except 19.vi.-22.vi.2001; 5 ♂ same data as previous except 22.vi.-26.vi.2001; 1 ♂ same data as previous except watershed 4B, 39°04.65'N 96°35.75'W, 12.vi.-15.vi.2001; 1 ♂ same data as previous except 22.vi.-26.vi.2001 (KSUC); *MISSOURI: 2 ♂ Boone Co., Columbia, 7.vi.1970, Malaise trap (UCDC).

Discussion.—*Coelinus robiniae* was previously known only from the holotype, which Riegel (1982) indicated was deposited at the "Connecticut Agricultural Experiment Station...(CONN)." All types in the Connecticut Agricultural Experiment Station collection were transferred to USNM in 1962 (G. Ridge in litt.), and thus, Riegel apparently deposited the holotype in USNM. The metasoma is intact unlike holotypes of other species described in Riegel (1982). Thus, a glass vial is not associated with the specimen. The mesothoracic legs are missing, as is one metathoracic leg, one forewing, and one hind wing. One prothoracic leg is broken at the trochanter; the rest of the leg, except for the trochantellus, is glued to the card. The specimens from UCDC and KSUC expand the range of this species to central Missouri and northeastern Kansas, respectively.

Coelinus ruthae (Riegel), new combination
(Fig. 31)

Coelinidea ruthae Riegel 1982: 79, 85 [SEMC, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "Pagosa Springs [:] Colo.

7-5-37 [;] C. L. Johnston". Second label (white; typewritten) = "Wing on [;] Sl. No.". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] ruthae [;] Riegel" (SEMC).

Discussion.—*Coelinus ruthae* is known only from the holotype, which Riegel (1982) indicated was deposited at "KU." The holotype bears a glass vial with a cork cap between the top and second labels. The vial contains the posterior portion of the metasoma. The antennae are broken, as is the tarsus of one mesothoracic leg. One forewing is mounted on a slide.

Coelinus sommermanae (Riegel),
new combination
(Fig. 32)

Coelinidea sommermanae Riegel 1982: 80, 93 [CUIC, examined].

Type material.—*Holotype male*: Top label (white; typewritten) = "Downie Creek [;] Selkirk Mts. [;] 14 Aug.'05 Br Col [;] J. Ch. Bradley". Second label (white with red border; handwritten) = "Coelinus [;] Nees". Third label (brown; partially handwritten, partially typewritten) = "HOLOTYPE ♂ [;] Coelinidea [;] sommermanae [;] Riegel". Fourth label (red; partially handwritten, partially typewritten) = "HOLOTYPE [;] Cornell U. [;] No. 6490" (CUIC).

Discussion.—*Coelinus sommermanae* is known only from the holotype, which Riegel (1982) indicated was deposited at "CN." The holotype bears a glass vial with a cork cap between the second and third labels. The vial contains the posterior portion of the metasoma. The antennae are broken.

NAMES CONSIDERED *NOMINA DUBIA*

The holotypes of four species of *Coelinidea* described in Riegel (1982) apparently are lost: *C. antha*, *C. arca*, *C. colora*, and *C. coma*. Riegel (1982) indicated that the holotype of each species was deposited at the "Philadelphia Academy of Natural Sciences...(PHIL)." The holotypes do not

appear in the ANSP primary type database. Further, I searched throughout the entire ANSP collection in 2006 but did not find any specimens that could potentially be the holotypes. Museum visits and/or correspondence with curators and collection managers confirmed that the holotypes are not in any of the repositories referenced in Riegel (1982). The holotypes of *C. antha*, *C. colora*, and *C. coma* will be difficult to locate in the absence of an explicit holotype label because the locality label on each of the three specimens is apparently "Col," (Riegel 1982), an abbreviation for Colorado that is the only locality information for many specimens in ANSP. Recognition of *C. arca* in the absence of an explicit holotype label may be possible, as locality data according to Riegel (1982) are "Cochise Co., Arizona, July 26, 1919, Pinery Canyon, 6000 feet, Chiricahua Mts., Witmer Stone." All four species are known only from the holotypes; the original descriptions and key to North American species of *Coelinidea* in Riegel (1982) do not provide enough detail to apply the names unequivocally. Therefore, the names *C. antha*, *C. arca*, *C. colora*, and *C. coma* are considered *nomina dubia*.

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